Thromboembolic Disease in Pregnancy

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Introduction

- Venous TED is one of the major causes of direct maternal deaths. Those who survive suffer significant morbidity
- **2- 4** fold increase compared to non-pregnant state
- Cesarean delivery > vaginal delivery
- 75% of DVT occur antepartum (equally distributed among all three trimesters)
- 40 - 60% of Pulmonary Embolism (PE) occur after delivery
- **PE is the major <u>non-obstetric</u> cause of maternal mortality**
  - 2/100,000 pregnancies
  - Fatality rate: 15%

Why pregnancy is associated with increased tendency for clotting ?

- Venous stasis
- ↑production of clotting factors 5, 8, Von Willebrand, fibrinogen
- ↓Anticoagulants: **protein S** & **anti-thrombin**
- ↓ fibrinolytic activity via increased plasminogen activation inhibitor
- Endothelial damage during pregnancy & delivery

Risk factors for TED

- Age over 35 yrs
- Multi parity (≥ 4)
- Obesity (> 80 kg)
- Preeclampsia
- Immobility
- Pelvic or leg trauma
- Smoking
- Atrial fibrillation
- Personal or family H/O TED
- Thrombophilia (anti-thrombin deficiency, factor V Leiden, protein C, protein S Deficiency)
- Anti-phospholipid Abs & lupus anticoagulant
- Operative delivery (emergency C/S > elective)
- Previous history of IUFD, early Preeclampsia , IUGR, abruption

Types of venous thrombosis

1- Superficial thrombo- phlebitis

2- Calf (below knee) DVT

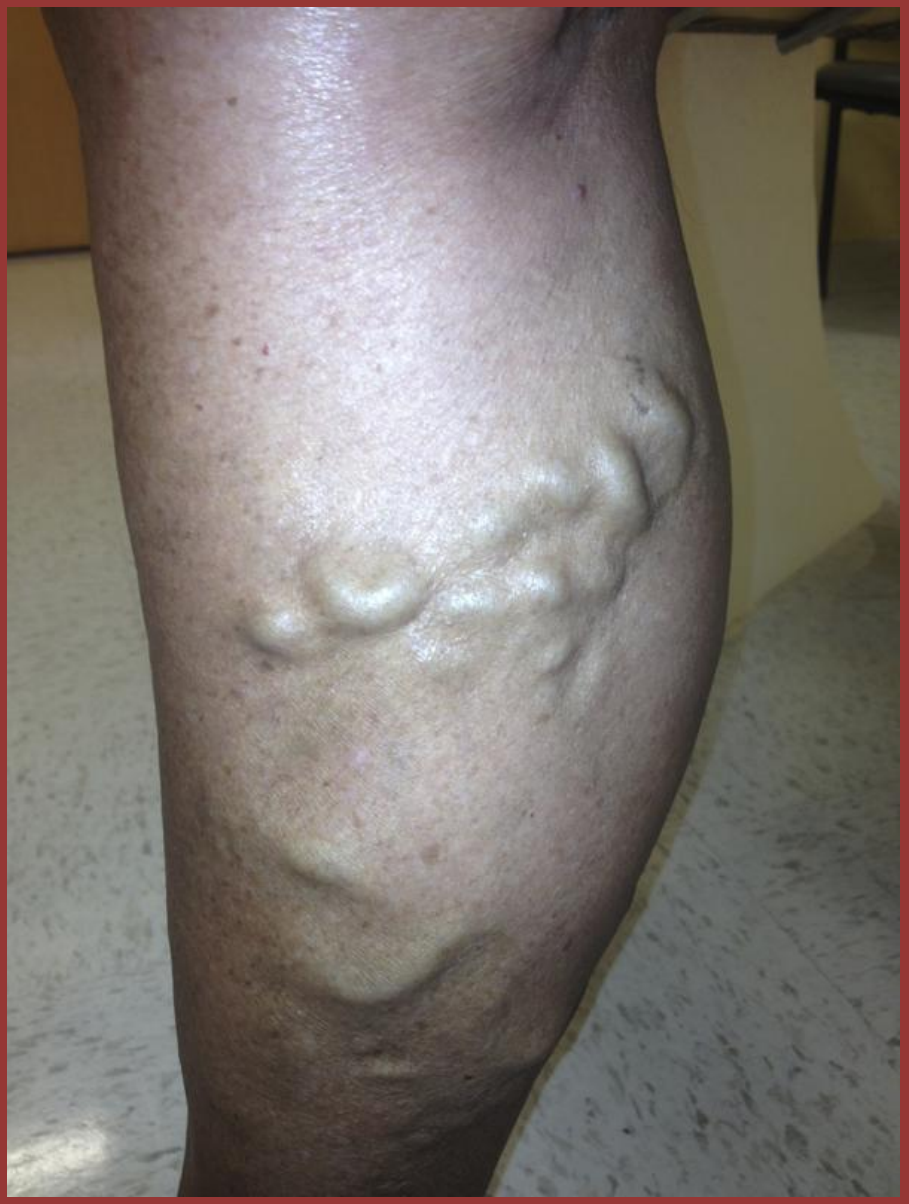
3- Proximal or ilio-femoral DVT : 70% of DVT in pregnancy

Diagnosis

- Clinical diagnosis is difficult and inaccurate in over 60% of cases of TED, Why?
- Leg symptoms (edema and pain) and dyspnea are common in pregnancy and mimic symptoms of DVT/ PE
- Tachycardia may be a normal physiologic response

1-Superficial thrombophlebitis

- It is the commonest form of venous thrombosis in pregnancy & puerperium.
- It occurs in about **1%** of patients and nearly always arise in existing varicose veins
- The diagnosis is clinically obvious (tenderness, erythema, palpable cord-like veins)



1-Superficial thrombophlebitis

- Treatment is usually **symptomatic** with compression bandage, leg elevation and encourage mobility
- In some patients **DVT** needs to be excluded as it may co-exist with it

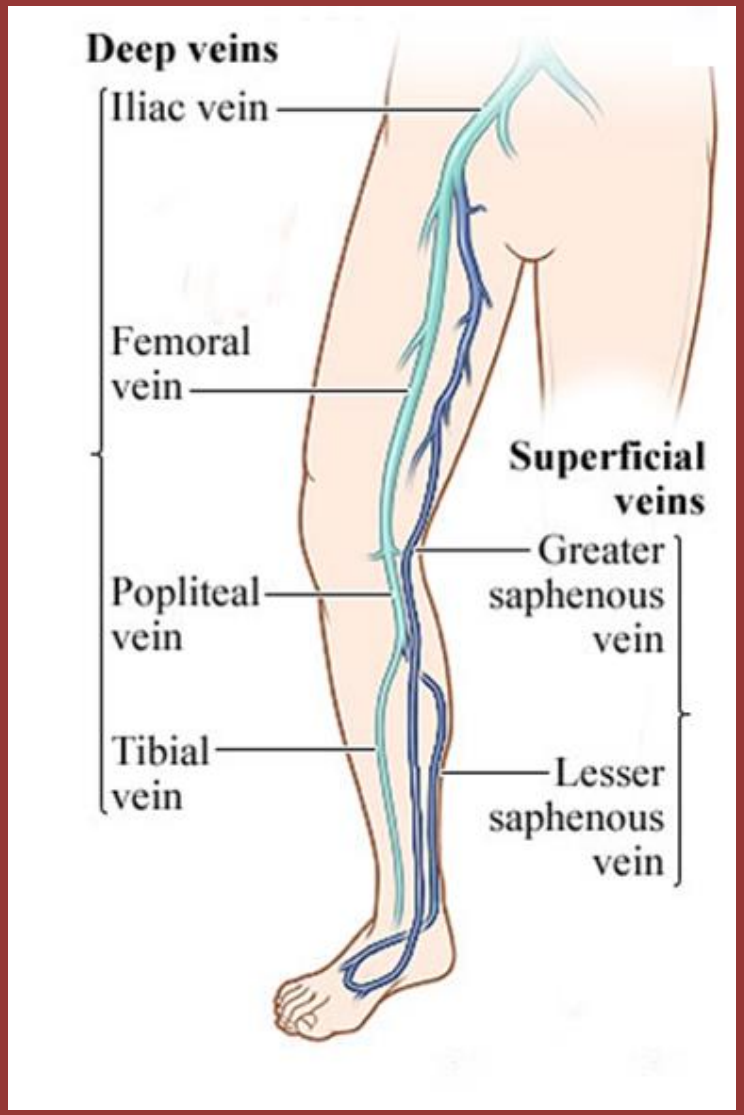
2- Calf DVT (CVT)

- The most common clinical features are pain, local tenderness, swelling, change in skin colour and temperature
- Most of CVT resolve spontaneously (75-80%) except when the thrombus spreads up to involve the proximal deep veins (20-25%) in which case there is 50% risk of **pulmonary embolism**

3-Proximal/ Iliofemoral DVT

- It occurs more commonly than Calf DVT
- Symptoms are more dramatic with **pain** and **swelling** involving the entire limb
- If the arterial supply is unimpaired, the leg appears swollen, blue & warm.
- If **arterial spasm** occurs secondary to irritation from the nearby clotted vein, the leg becomes swollen, painful, **white** & cold

3-Proximal / Iliofemoral DVT



Investigations for DVT

- **Contrast venography**
- **Duplex ultrasonography** : commonly used with a sensitivity and specificity of 97%
- **Compression ultrasonography**
- **MRI** : sensitivity and specificity 100% in non-pregnant patients
- **Pelvic vein ultrasound**, **CT scan** and **MRI** are all tests that can be used to look for pelvic clot
- **D-Dimer** test not useful in pregnancy because it normally increases with gestational age

4- Pulmonary Embolism (PE)

- A high index of suspicion is always needed for the diagnosis of PE especially in patients with DVT or risk factors for VTE
- The **maternal mortality** rate from untreated PE is **13%** with the majority within **1 hour** of the event
- With early diagnosis & treatment, the **survival rate** is **92-95%**

Common symptoms & signs of PE

- Tachypnoea
- Dyspnoea
- Haemoptysis
- Pleuritic chest pain
- Tachycardia
- Cyanosis
- Pyrexia
- Syncope or varying degree of shock

These S &S are non-specific and in most cases there is no prior clinical evidence of DVT

Investigations for suspected PE

- Chest X- ray
- ECG
- Blood Gases
- Compression Duplex Doppler : to exclude DVT
- Ventilation-perfusion lung scan (V/Q)
- Spiral CT scan : superior to V/Q scan
- CT angiography
- *If the abdomen or pelvis is not being imaged, such as in chest CT , there is no risk to the baby from radiation*

Treatment of acute phase TED

- **Standard heparin IV** or the more preferred **LMWH S.C** (more effective and safer) : should be started once the diagnosis is clinically suspected until excluded by objective testing
- Treatment aims at achieving **APTT 2-2.5** the control for **1 week** then continue with prophylactic dose for **6 - 12 weeks** postnataly
- For PE it should be continued for **4 - 6 months** postnataly
- Safe during breastfeeding

Treatment of acute phase TED

- **Heparin** is the anticoagulant of choice in pregnancy. It does not cross the placenta and in overdose action can be reversed by **protamin sulphate**
- Osteoporosis & thrombocytopenia are complications of prolonged heparin treatment → platelet count should be monitored regularly

Treatment of acute phase TED

- Legs should be elevated & graduated elastic compression stocking should be worn to reduce oedema
- In DVT, calf circumference should measured daily to help monitoring the response to treatment
- Massive PE requires **ICU** & multi disciplinary team approach
- Recurrent PE may require **inferior vena cava filter**

Treatment of acute phase TED

- **Thoracotomy with embolectomy** may be life saving
- **Heparin** thrombo-prophylaxis must be considered in the **subsequent pregnancies** or if additional risk factors appear

Oral Anticoagulants

- Cross the placenta and are potentially **teratogenic** at any stage of pregnancy
- **Warfarin teratogenicity**: nasal hypoplasia, depressed nasal bridge, irregular bone growth & intracranial fetal haemorrhage
- However , they can be given after delivery and is safe for lactation

FETAL WARFARIN SYNDROME

- Saddle nose
- Retarded growth
- Defects of limbs, eyes and central nervous system

Other agents

- **Streptokinase** (plasminogen activator): Class C
- **Rivaroxaban** (Anti-factor Xa inhibitor): Class C

FDA Classification:

C: animal studies have shown an adverse effect/risk on the fetus & there are no good studies in humans, but potential benefits may warrant use of the drug despite potential risks